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Lectotypification of names in *Parkia* R.Br. (Leguminosae: Caesalpinioideae, mimosoid clade) for Africa and Madagascar

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Summary. Ten specific names plus those of three varieties, which refer to the four currently recognised species of *Parkia* in Africa and Madagascar (*P. bicolor* A.Chev., *P. biglobosa* (Jacq.) R.Br. ex G.Don, *P. filicoidea* Welw. ex Oliv., *P. madagascariensis* R.Vig.), are listed. Their types are enumerated with lectotypes indicated where necessary and in a few cases, a second-step lectotypification is made. Two further names are invalid and illegitimate respectively. Two tables summarise the synonymy of these names according to major flora treatments and revisions of the genus. Connections between the botanist Robert Brown, who established the genus *Parkia*, and the explorer Mungo Park, after whom Brown named it, are described briefly.

Key Words. Fabaceae, Hugh Clapperton, Mimosoideae, syntype, taxonomy.

Introduction

The last revision of *Parkia* R.Br. (Leguminosae: Caesalpinioideae, mimosoid clade) for the African region, some 40 years ago, recognised three native species in continental Africa and one in Madagascar (Hopkins 1983) and this has become the generally accepted taxonomy (e.g. Lebrun & Stork 1992; Lock 1989). All three species on the African mainland (*P. bicolor* A.Chev. from forest, *P. biglobosa* (Jacq.) R.Br. ex G.Don from woodland/savanna, *P. filicoidea* Welw. ex Oliv. from forest) are widespread and morphologically variable and in all cases this variation has a geographical component. Recent studies involving microsatellite data and phylogenetic analyses based on rDNA and pDNA by Ahossou (2022; Ahossou *et al.* 2020) for the species on the African mainland are likely to lead to the re-evaluation of the species concepts in Hopkins (1983). It is therefore timely to lectotypify the names of these taxa and their current synonyms to aid the selection of appropriate names if more species or subspecies are recognised as a result of Ahossou's work.

Table 1 lists the principal names that have been used by different authors to refer to *Parkia* in Africa and Madagascar and their placement in taxonomic treatments and major flora accounts, especially those written by the legume expert E. G. Baker and by mimosoid specialists such as J. P. M. Brenan and J.-F. Villiers. Many more recent country or local floras and checklists have been published but most are based on the established taxonomy and so are not cited. For the African mainland, nine names that have been validly and legitimately published at species level in *Parkia* are discussed here, with a further three at varietal level, plus two others that are illegitimate or invalid respectively (Table 2). In addition to these, several early names that are considered synonyms of *P. biglobosa* were discussed briefly elsewhere (Hopkins 1983) and are not dealt with again. One further name at species level refers to *Parkia* in Madagascar.

From the mid 20th century onwards, all the African names mentioned here were generally regarded as referring to only four species (Baker 1930; Hagos 1962; Keay 1958), later reduced to three by Hopkins (1983), who widened the concept of *Parkia biglobosa* because of its pattern of continuous variation in a suite of leaf characters. The single species in Madagascar, *P. madagascariensis* R.Vig., has a limited distribution in forest in the northwest of the island and remained little known until quite recently, when photographs and much better collections became available. Its status as a monomorphic local endemic has not been questioned (Hopkins 1983; Villiers 2002).

Robert Brown, Mungo Park, Hugh Clapperton and *Parkia*

The genus *Parkia* was established in 1826 by Robert Brown (born 1773, died 1858) and named to commemorate the explorer Mungo Park (born 1771, died 1806). Although Schwartz (2021) concluded that there was no evidence that these two Scotsmen knew each other, it is likely that they met in the early 1790s at Edinburgh University where both studied medicine (Park from 1788 to 1791, Brown from 1790 to 1793) and both apparently took a course in botany given by Daniel Rutherford in the summer of 1791 (Duffill

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Table 1. Principal names referring to *Parkia* in Africa and Madagascar and their synonymy indicated in major Flora treatments and revisions.

	Name	Date name published	FTA (1871)	Leg. Trop. Africa (1930)	Fl. Congo Belge (1952)	Consp. Fl. Angolensis (1956)	FWTA (2nd ed. 1958)	FTEA (1959)	FZ (1970)	Fl. Gabon (1989)	Fl. Somalia (1993)	Leg. Mad. (2002)	Hagos (1962)	Hopkins (1983)
1.1.	**Parkia bicolor** *A.Chev.*	1908	–	*P. bicolor*	–	*P. bicolor*	*P. bicolor*	–	–	*P. bicolor*	–	–	*P. bicolor* var. *bicolor*	*P. bicolor*
1.2.	**Parkia agboensis** *A.Chev.*	1908	–	*P. bicolor*	–	–	*P. bicolor*	–	–	*P. bicolor*	–	–	*P. bicolor* var. *agboensis* (A.Chev.) Hagos & de Wit	*P. bicolor*
1.3.	**Parkia klainei** *Pierre ex De Wild., nom. inval.*	1907	–	*P. bicolor*	*P. bicolor*	–	–	–	–	*P. bicolor*	–	–	*P. bicolor* var. *bicolor*	*P. bicolor*
1.4.	**Parkia zenkeri** *Harms*	1911	–	*P. bicolor*	*P. bicolor*	*P. bicolor*	*P. bicolor*	–	–	*P. bicolor*	–	–	*P. bicolor* var. *bicolor*	*P. bicolor*
2.1.	**Parkia biglobosa** (*Jacq.*) *R.Br. ex G.Don*	1830	*P. biglobosa*	*P. biglobosa*	–	–	*P. biglobosa*	–	–	–	–	–	*P. biglobosa*	*P. biglobosa*
2.2.	**Parkia africana** *R.Br., nom. illeg.*	1826	–	*P. filicoidea*	–	–	*P. clappertoniana*	–	–	–	–	–	*P. africana*	*P. biglobosa*
2.3.	**Parkia oliveri** *J.F.Macbr.*	1919	*"P. intermedia"*	*P. oliveri*	–	–	*P. clappertoniana*	–	–	–	–	–	*P. africana*	*P. biglobosa*
2.4.	**Parkia filicoidea** *Welw. ex Oliv.* var. **glauca** *Baker f.*	1930	–	*P. filicoidea* var. *glauca*	–	–	*P. clappertoniana*	–	–	–	–	–	*P. africana*	*P. biglobosa*
2.5.	**Parkia clappertoniana** *Keay*	1955	*P. filicoidea*	–	–	–	*P. clappertoniana*	–	–	–	–	–	*P. africana*	*P. biglobosa*
3.1.	**Parkia filicoidea** *Welw. ex Oliv.*	1871	*P. filicoidea*	*P. filicoidea*	*P. filicoidea*	*P. filicoidea*	*P. filicoidea*	*P. filicoidea*	*P. filicoidea*	*P. filicoidea*	*P. filicoidea*	–	*P. filicoidea* var. *filicoidea*	*P. filicoidea*

Table 1. (continued)

	Name	Date name published	FTA (1871)	Leg. Trop. Africa (1930)	Fl. Congo Belge (1952)	Consp. Fl. Angolensis (1956)	FWTA (2nd ed. 1958)	FTEA (1959)	FZ (1970)	Fl. Gabon (1989)	Fl. Somalia (1993)	Leg. Mad. (2002)	Hagos (1962)	Hopkins (1983)
3.2.	**Parkia hildebrandtii** *Harms*	1899	–	*P. filicoidea*	–	–	–	*P. filicoidea*	–	*P. filicoidea*	*P. filicoidea*	–	*P. filicoidea* var. *hildebrandtii* (Harms) Chiov.	*P. filicoidea*
3.3.	**Parkia bussei** *Harms*	1902	–	*P. filicoidea*	*P. bussei*	–	–	*P. filicoidea*	–	*P. filicoidea*	–	–	*P. filicoidea* var. *filicoidea*	*P. filicoidea*
4.1.	**Parkia madagascariensis** *R.Vig.*	1949	–	–	–	–	–	–	–	–	–	*P. madagascariensis*	–	*P. madagascariensis*

FTA = *Flora of Tropical Africa* (Oliver 1871)

Leg. Trop. Africa = *The Leguminosae of Tropical Africa* (Baker 1930)

Flore du Congo Belge = *Flore du Congo Belge et Rwanda-Urundi* (Gilbert & Boutique 1952) (series now: *Flore d'Afrique Centrale*)

Consp. Fl. Angolensis = *Conspectus Florae Angolensis* (Exell & Mendonça 1956)

FWTA = *Flora of West Tropical Africa* (Keay 1958)

FTEA = *Flora of Tropical East Africa* (Brenan 1959)

FZ = *Flora Zambesiaca* (Brenan 1970)

Fl. Gabon = *Flora of Gabon* (Villiers 1989)

Fl. Somalia = *Flora of Somalia* (Thulin 1993)

Leg. Mad. = *The Leguminosae of Madagsacar* (Villiers 2002)

Table 2. Alphabetical list of names in *Parkia* dealt with in this paper, showing their synonymy according to Hopkins (1983).

Parkia africana R.Br., *nom. illeg.*	syn. of *P. biglobosa*
Parkia agboensis A.Chev.	syn. of *P. bicolor*
Parkia bicolor A.Chev.	
P. bicolor A.Chev. var. *bicolor*	
P. bicolor A.Chev. var. *agboensis* (A.Chev.) Hagos & de Wit	syn. of P. *bicolor*
Parkia biglobosa (Jacq.) R.Br. ex G.Don	
Parkia bussei Harms	syn. of *P. filicoidea*
Parkia clappertoniana Keay	syn. of *P. biglobosa*
Parkia filicoidea Welw. ex Oliv.	
P. filicoidea Welw. ex Oliv. var. *filicoidea*	
P. filicoidea Welw. ex Oliv. var. *glauca* Baker f.	syn. of *P. biglobosa*
P. filicoidea Welw. ex Oliv. var. *hildebrandtii* (Harms) Chiov.	syn. of *P. filicoidea*
Parkia hildebrandtii Harms	syn. of *P. filicoidea*
Parkia klainei Pierre ex De Wild., *nom. inval.*	syn. of *P. bicolor*
Parkia madagascariensis R.Vig.	
Parkia oliveri J.F.Macbr.	syn. of *P. biglobosa*
Parkia zenkeri Harms	syn. of *P. bicolor*

Varietal names are indented once; invalid and illegitimate names are doubly indented

1999; Mabberley *et al.* 2022). This course was offered as part of their medical training although students were not obliged to take it. Neither Park nor Brown graduated from the university, probably in part because passing the exams was not a requirement for becoming a medical practitioner at that time (Duffill 1999).

Mungo Park's first visit to the tropics was due to the patronage of Sir Joseph Banks, who proposed that he took the position of assistant surgeon on a voyage to Sumatra where he collected and illustrated fish (Duffill 1999). Park then made two expeditions to West Africa to investigate the course of the Niger River and he established definitively for a European audience that it flowed west to east. His first expedition (1795 – 1797) was sponsored by the African Association, which was based in London and counted Sir Joseph Banks amongst its founders (Duffill 1999). In the account of his travels, Park mentioned the plant that Brown later named *Parkia africana* R.Br. (now a synonym of *P. biglobosa*) as the "nitta tree", describing it as a "species of mimosa" in which the "pods are long and narrow, and contain a few black seeds enveloped in the fine mealy powder before mentioned; the meal itself is of a bright yellow colour, resembling the flour of sulphur, and has a sweet mucilaginous taste: when eaten by itself it is clammy, but when mixed with milk or water, it constitutes a very pleasant and nourishing article of diet" (Park 1799: 336 – 337). *Parkia biglobosa* continues to be a food plant of some importance in West Africa although the semi-fermented seeds, used as a condiment, are more significant than the mealy pulp (Hall *et al.* 1997).

Scientific and geographical exploration were strongly inter-related in Britain at this time and a further connection between Brown and Park concerns a voyage of exploration to Australia. Sir Joseph Banks initially invited Park to take part in this expedition but he turned down the opportunity, hoping to return to West Africa. Banks found a replacement for Park in Brown, who sailed to Australia on the *Investigator*, commanded by Matthew Flinders, in 1801 – 1803, and this led to Brown's subsequent immense contribution to the description of the flora of Australia (Mabberley *et al.* 2022). Park got his wish to return to West Africa, sponsored this time by the British government, although his second expedition (1805 – 1806) was not regarded as a success, even though he travelled a considerable distance down the Niger. He died aged just 35 near Bussa rapids on the Niger, in what became Nigeria, most of the other expedition members having already died along the route.

Robert Brown based his description of the genus *Parkia* partly on material collected in West Africa by another Scotsman, Hugh Clapperton (see below under *P. africana*). Like Park, he took part in two expeditions to the region and for the first of these (1822 – 1825), with Dixon Denham and Walter Oudney, he travelled from Tripoli in Libya to Bornu, now in Nigeria, and back again; this trio became the first Europeans to see Lake Chad. Also, like Mungo Park some 20 years before him, Clapperton (born 1788, died 1827), perished in Nigeria on his second expedition to West Africa (Clapperton & Lander 1829). According to Brown (1826: 233), *P. africana* was known in Bornu as "Doura" and its preparation was described by Clapperton as follows: "The seeds are roasted as we roast coffee, then bruised, and allowed to ferment in water; when they begin to be come putrid, they are well washed and pounded; the powder made into cakes, somewhat in the fashion of our chocolate;

they form an excellent sauce for all kinds of food. The farinaceous matter surrounding the seeds is made into a pleasant drink, and they also make it into a sweetmeat."

Materials and Methods

Names referring to *Parkia* in Africa and Madagascar are listed in date order within the four species concepts of Hopkins (1983), with invalid and illegitimate names discussed briefly. The varieties established by Hagos and de Wit (Hagos 1962) and Chiovenda (1932) are treated under their basionyms. Two names from Madagascar that were originally published in *Parkia* but which refer to species of *Xylia* Benth. are not discussed. Barcodes for herbarium sheets and material in carpological boxes or in spirit are given where known and material seen, either in the herbarium or as an online image, is indicated "!"; "n.v." is indicated only where necessary to avoid confusion. The abbreviations "lv.", "fl." and "fr." indicate leaves, flowers and fruits respectively. Images of many types were viewed through Jstor Global Plants (online). Other online databases, many with images, were also consulted, including those for collections at B, BM, BR, E, G, K, L, MO, P, US, W and WAG. Most of the websites for these herbaria were located using *Index Herbariorum* (Thiers, continuously updated).

Names and Types

1. *Parkia bicolor* A.Chev.

1.1. Parkia bicolor *A.Chev.* (Chevalier 1908: 34).
Types as cited in the protologue: "Guinée française. – Environs de Kindia, dans les galeries au bord des rivières, mars 1905 (en fleurs) n° 13389, et mai 1905 (en fruits), n° 13547 [*Aug. Chevalier*]".
Lectotype, designated here: Guinea, Kindia, May 1905, *Chevalier* 13547 (WAG! WAG0001814 [lv. & fr.]; isolectotypes: BR! BR00000062519, K! K000232184, P! ×3 P00418336, P00418337, P00418338, WAG! WAG0001813).
Residual syntype: Guinea, near Kindia, March 1905, *Chevalier* 13389 (P! P00418339 [capitula only]).

The principal set(s) of material collected by Chevalier are at P (Jstor Global Plants, online). However, the sheet at WAG (WAG0001814) that is chosen as the lectotype has leaves, pods and locality notes whereas the sheets of *Chevalier* 13547 at P, K and BR have either leaves only or fruit only and some are in poor condition. It is likely that Chevalier had access to all the material when he described both of his species of *Parkia* and that the duplicates were distributed subsequently.

1.2. Parkia agboensis *A.Chev.* (Chevalier 1908: 35).
Parkia bicolor var. *agboensis* (A.Chev.) Hagos & de Wit (in Hagos 1962: 251). Types as for *P. agboensis*.
Types as cited in the protologue: "Côte d'Ivoire. – Commun dans les parties humides de la forêt vierge : bords de la rivière Agniéby, au pont du chemin de fer (Agbo), 5-10 janv. 1907 (en fleurs), n° 16925 et bords de la lagune de Dabou, 6 février 1907 (en fruits mûrs), n° 16981 [*Aug. Chevalier*]".
Lectotype, designated here: Côte d'Ivoire, R. Agniéby, Agbo, 5 – 10 Jan. 1907, *Chevalier* 16925 (P! P00418340 [lv. & capitula]; isolectotypes: P! ×4, P00418341, P00418342, P00926579, P00926580).
Residual syntypes: Côte d'Ivoire, bords de la lagune de Dabou, 6 Feb. 1907 (fr.), *Chevalier* 16981 (P! ×3, P00418343, P00418344, P00418345).

Chevalier (1908) published the names *Parkia bicolor* and *P. agboensis* simultaneously. Baker (1930) appears to have been the first to put *P. agboensis* into the synonymy of *P. bicolor* and for West Africa, this has been followed by most subsequent authors (e.g. Keay 1958 for West Africa in general; Aké Assi 2001 for Côte d'Ivoire; van der Maesen 2006 for Benin). When Hagos (1962) made the combination *P. bicolor* var. *agboensis*, he placed only three collections, all from Côte d'Ivoire, in this variety (*de Wit* 9032 [WAG! ×4], *de Wilde* 1050 [WAG! ×5], *Leeuwenberg* 2419 [WAG! ×2]) and put all other material from Upper Guinea into *P. bicolor* var. *bicolor*.

1.3. Parkia klainei *Pierre ex De Wild.* (De Wildeman 1907: 129), *nom. inval., nom. nud.*
Specimen cited by De Wildeman (1907): "Eala, 1er août (Marc. Laurent, n. 1828)."

This was originally a manuscript name given to a small number of specimens at BR by the French botanist J. P. Louis Pierre (De Wildeman 1907). It commemorates Klaine, a missionary in Gabon, on whose specimens Pierre worked (Breteler 2005) although the material cited by De Wildeman (1907: 129; 1910: 190) under this name was not collected by Klaine.

Parkia klainei, or its orthographic variant *P. klainii*, has appeared in several publications but the name has never been validly and legitimately published. For instance, De Wildeman (1907, 1910) listed it twice as a nomen nudum and although Chevalier (1916: 193) and Pellegrin (1924: 111) mentioned characters of the wood and flower colour respectively, this is insufficient to constitute a description or diagnosis. Heitz (1943) provided a description in French but it was published after the requirement date for a description in Latin and furthermore, he cited the names *P. bicolor* and *P. zenkeri* as synonyms, which would have made the name illegitimate, even if his description had been in Latin.

This name does not appear in IPNI (online) although it is listed in GBIF (online) where images of two sheets of *Laurent* 1828 from LY are shown, bearing

determination labels of E. De Wildeman (LY0227144, three fruits; LY0227145, three leaves).

1.4. Parkia zenkeri *Harms* (1911: 34).
Types as cited in the protologue: "Kamerun: Bipindi, Urwald der Fluβtäler, 15 – 20 m hoher Baum, mit gelbzinnoberroten Blüten (Zenker n. 3498. – Okt. 1907). – Edea (Büsgen n. 432. – 1908/9); ebendort, in Urwald (Krücke n. 13. – Dez. 1909)".
Lectotype, designated here: Cameroon, [Prov. Sud, Dépt. Océan], Bipindi, 1908, *Zenker* 3498 (K! K000232179 [lv. & capitulum]; isolectotypes: BM! BM013719098, BR! BR0000016786585, E! E00957601, HBG! HBG519318, L! L2031679, M! M0108316, MO! MO-954321, S! ×2, S13-12059, S13-12060, US! US00001042, W! W186311; Hagos (1962) and Hopkins (1983) also reported type material at G and GOET that is not currently on Jstor Global Plants nor in other databases).
Residual syntypes: No material is known to be extant for either *Büsgen* 432 or *Krücke* 13.

Harms was based at B and the top set of material collected by George Zenker was also at B (Jstor Global Plants online; TL-2 online). However, all the type material of *Parkia zenkeri* at B, including collections by Büsgen and Krücke, appears to have been destroyed.

Baker (1930) put the name *Parkia zenkeri* into the synonymy of *P. bicolor* and this has been followed by most subsequent authors, including Hagos (1962), who placed all the material he studied from Lower Guinea and the Congo in *P. bicolor* var. *bicolor*, including *Zenker* 3498. Major flora treatments for Gabon and the Congo (Gilbert & Boutique 1952; Villiers 1989) and Angola (Exell & Mendonça 1956) also placed *P. zenkeri* in the synonymy of *P. bicolor*, as did de la Estrella *et al.* (2010) for Equatorial Guinea. Mimosoid legumes have not yet been treated for the *Flora of Cameroon*.

2. *Parkia biglobosa* (Jacq.) R.Br. ex G.Don
A number of synonyms of *Parkia biglobosa* from publications that predate Brown (1826) and that have rarely been taken up in the literature or the herbarium are not discussed here. For several, no obvious type is known or the name is based on the type of *P. biglobosa*. These names are listed in IPNI (online) under *P. biglobosa* and most are also discussed in Hopkins (1983).

2.1. Parkia biglobosa (*Jacq.*) *R.Br. ex G.Don* (in Loudon 1830: 277), *excl. cit.* P. Beauv.
Basionym: *Mimosa biglobosa* Jacq. (Jacquin 1763: 267).
Lectotype (designated in Hagos [1962: 254]): Jacquin (1763), tab. 179, fig. 87, based on a specimen from Martinique.

Many Jacquin collections are at BM but no herbarium specimen referable to his *Mimosa biglobosa* appears to be extant there. The original material is more than likely to have included leaves and capitula collected in the field plus preliminary drawings, as well as the published illustration in Jacquin (1763). Since the illustration is the only element from amongst these that is known to be still in existence, it is cited here as a lectotype, rather than a holotype. Hagos (1962: 254) appears to have been the first to cite this drawing as the "type", and so the lectotypification is attributed to him.

2.2. Parkia africana *R.Br.* (Brown 1826: 234), *nom. illegit., nom. superfl.* (see Mabberley *et al.* 2022: 382).

Brown (1826) described *Parkia africana* at the same time as he published the generic name *Parkia*. Under *P. africana*, he cited several synonyms including *Inga biglobosa*. This is an indirect reference to Jacquin's *Mimosa biglobosa* (Jacquin 1763) through the combination *Inga biglobosa* (Jacq.) Willd. (Willdenow 1806: 1025) and thus *P. africana* is a superfluous name, and as such, it is illegitimate and its type is that of *Mimosa biglobosa* (contra Hopkins 1983).

The material available to Brown that he used in part for his description of *Parkia africana* was collected by Hugh Clapperton (*Clapperton* s.n., s.dat., BM! BM000842200 [leaf only], BM000842199 [fruit, seeds, peduncle and clinanthium i.e. the swollen receptacle at the end of the peduncle on which the flowers are borne], both parts mounted on the same sheet). Three labels on this sheet were written by Brown, with the locality of Bornu added in a different hand. Brown's description of leaf characters for *P. africana* does not entirely agree with the leaf of *Clapperton* s.n. (see Keay [1955] and Hagos [1962] for discussion).

Most of the plant specimens from Denham, Oudney and Clapperton's expedition to western Africa were collected by Oudney, who died during the expedition, and only a few were made by Clapperton (Brown 1826). Their plant material was presented to Brown who wrote the botanical appendix for the account of their "Travels", and the specimens were incorporated into BM from Brown's personal herbarium in the late 1800s, following his death (J. Wajer, pers. comm. 2022).

Keay (1955) gave reasons for considering the name *Parkia africana* illegitimate and he published *P. clappertoniana* Keay to replace it. Hagos (1962) discussed at some length why he chose to resurrect *P. africana* but I follow Mabberley *et al.* (2022), in agreement with Keay.

Brown (1826) cited the following references under *Parkia africana*: "*Palis de Beauv. Flore d'Oware*, 2. p. 53. tab. 90. *Sabine in Hortic. Soc. Transact.* 5. p. 444. *De Cand. Prodr.* 2. p. 442". The reference to Palisot de Beauvois (1816, 1818) must be excluded because this author confused *P. biglobosa* and *P. bicolor* under the name "*Inga biglobosa* Willd." (Hopkins 1983: 145). The plant illustrated by Palisot de Beauvois does not closely resemble *P. biglobosa* and although the leaves and the height of the tree ("moyenne élévation") could suggest this species, the habitat ("sur le bord des rivières") and depictions of the capitula and flowers do not. The flowers of the apical part of the capitulum are shown with far exserted stamens, which is incorrect for any species of *Parkia* in Africa. Palisot de Beauvoir's material of this genus at G belongs to *P. bicolor* (Hopkins 1983).

2.3. Parkia oliveri *J.F.Macbr.* (Macbride 1919: 19).
Parkia intermedia Oliv. (Oliver 1871: 324), *nom. illeg., non P. intermedia* Hassk. (Hasskarl in Hoeven & de Vriese 1843: 149).
Type (as cited in the protologue of *P. intermedia* Oliv.): "Upper Guinea. Island of St. Thomas. Dr. Welwitsch! Mann!".
Lectotype: [São Tomé and Príncipe], Island of St Thomas, *Mann* 1099 (K! K000232177 [lv. & fl.]; isolectotypes: K! K000232176 [fr. & capitula in bud], P ×2 P00418347, P00418348); first-step lectotypification by Exell [1944: 169], second-step lectotypification made here).
Residual syntypes: [São Tomé and Príncipe], Island of St Thomas, Dec. 1860, *Welwitsch* 1788 (BM! BM000842198, K!, LISU); *Welwitsch* carp. col. 530 (BM! BM001100676).

Macbride (1919) provided a nomen novum for *Parkia intermedia* Oliv. because that name was already occupied by *P. intermedia* Hassk. (Hasskarl 1843) and he made no comment about the type. Exell (1944) stated that the type of *P. oliveri* was *Mann* 1099 at K, but because two sheets of this gathering are at K, a second-step lectotypification is made here and the lectotype is the sheet with annotated drawings. An additional sheet at K with a label only indicates that further material is in the spirit collection but no record for this was found in the catalogue in April 2022. Exell (1944) also mentioned two collections by Welwitsch, 1788 (BM, K, LISU) and coll. carp. 503 (BM); the latter is a probably a residual syntype since Oliver would have had access to any material now at BM. It is not clear whether the carp. collection is from the same gathering as *Welwitsch* 1788 or a different one.

2.4. Parkia filicoidea *Welw. ex Oliv.* var. **glauca** *Baker f.* (1930: 781).
Type as cited in the protologue: "Togoland : Kete Kratachi [sic], *Kitson* sine No.".
Lectotype, designated here: [Ghana], Kete Krachi ["Kratachi"], 11 April 1915, *Kitson* s.n. (BM! BM000842197); isolectotype: *Kitson* s.n. (BM! BM001100687 [carp. coll.]).

Baker (1930) cited a single collection as the type and the material at BM is in two parts, an herbarium sheet and fruits in the carp. collection; the name is lectotypified here on the herbarium sheet.

2.5. Parkia clappertoniana *Keay* (1955: 209).
Type as cited in the protologue: "Nigeria : [...]. Ilorin Prov., Ilorin town, 11 Dec. 1954 (fls. & lvs.) and 26 Feb. 1955 (frts.), *Onochie* FHI 34652 (K, holotype; BM, P, BR, B, isotypes)".
Lectotype designated here: Nigeria, Ilorin, 11 Dec. 1954, [fl. & lv.], *Onochie* FHI 34652 (K! K000232180 p.p; isolectotypes: B! B10 0159198 + spirit material n.v., BM! BM103719099 p.p. + spirit material n.v., BR! ×2 BR0000006252267, BR0000006251598 p.p. + spirit material n.v., FHI, IFAN! IFAN10784 p.p. [*Onochie* s.n., 11 Dec. 1954], K! K000232181 p.p., K22090.000 [fl. in spirit], P! ×2 P00418333 p.p., P00418335).
Residual syntypes: Nigeria, Ilorin, 26 Feb. 1955, [fr.], *Onochie* FHI 34652 (B! B10 0160213, BM! BM103719099 p.p. + BM001100679 [carp. col., FHI 34625 in error], BR! ×2 BR0000006251598 p.p, BR0000006251611, FHI, IFAN! IFAN10784 p.p. [*Onochie* s.n., 26 Feb. 1955], K! ×2 K000232180 p.p, K000232181 p.p., P! ×2 P00418333 p.p., P00418334).

Although Keay (1955) designated material at K as the holotype, two sheets of *Onochie* FHI 34652 are at K: K000232180 has a holotype label and is marked "sheet 1" and K000232181 lacks a type label and is marked "sheet 2"; both sheets have leaves, flowers and fruits. However, Keay stated in the protologue that flowers and leaves were collected on 11 Dec. 1954 and fruits on 26 Feb. 1955, and so this material constitutes two separate gatherings. The flowering and leaf material on one sheet at K is designated here as the lectotype, with flowers and leaves elsewhere as isolectotypes, and the fruits at K and elsewhere, often mounted on the same sheets as the flowers and leaves, become residual syntypes. In addition to the herbarium material, flowers in spirit are preserved at K and also reported at B, BM and BR. Because the type was collected in the FHI number sequence, further type material presumably exists at that institution but this has not been verified.

3. *Parkia filicoidea* Welw. ex Oliv.
3.1. Parkia filicoidea *Welw. ex Oliv.* (Oliver 1871: 324), *pro parte, excl. spec.* Barter [1136] and description of pods.

Types as cited in the protologue: "Upper Guinea. Niger Expedition, Barter! Lower Guinea. Angola, prov. Pungo Andongo, Dr. Welwitsch! Mozamb. Distr. Shire valley, Zambesi land, Dr. Kirk!".
Lectotype: Angola, Pungo Andongo, 1857, [flowering material only], *Welwitsch* 1787 (LISU! LISU208886; isolectotypes: BM! BM000842195, COI! COI00006033 p.p., G! G00022501 p.p, K! K000232174 p.p., P! P00418346 p.p.; first-step lectotypification by Brenan [1959: 7], second-step lectotypification made here).
Residual syntypes: Angola, May 1857, [carp. only], *Welwitsch* 504 (BM! BM001100691); Angola, Pungo Andongo, 1857, [leaf material only], *Welwitsch* 1787 (BM! BM000842196, COI! COI00006033 p.p., G! G00022501 p.p., K! K000232174 p.p., LISU! ×2 LISU208887, LISU208888, P! P00418346 p.p.); [Malawi], Shire Valley, *Kirk* s.n. (K! ×2 K001235562 [19 Sept. 1859, lv. & fl.], K001235563 [Manganja Hills, s.dat., fl.]).

Oliver (1871) included a specimen by Barter [1136] (K000232182!) under *Parkia filicoidea* in his protologue but it was misidentified and Keay (1955) later referred it to *P. clappertoniana*. This is the only specimen mentioned in Oliver's protologue that definitely has fruit and so the part of his description that refers to the pod ("scarcely subterete") must be excluded from the concept of *P. filicoidea*.

Brenan (1959) cited *Welwitsch* 1787 from LISU as the lectotype of *Parkia filicoidea* and but as three sheets from this herbarium are shown in Jstor Global Plants (online), a second-step lectotypification is made here. The lectotype material (LISU208886) has previously been labelled as the holotype and it consists of capitula sliced longitudinally, with their peduncles and compound inflorescence axes, plus a packet containing loose flowers, with a handwritten description attached; the other two sheets at LISU consist of leaves only. However, a Welwitsch collection number can refer to material from several different individuals that he considered all to belong to a single species, rather than referring to a single gathering (Albuquerque *et al.* 2009). All the material seen that is labelled *Welwitsch* 1787 consists of either capitula and associated parts (peduncles, clinanthia, loose flowers) (LISU208886, BM000842195), or leaves (LISU20888, LISU208887, BM000842196), or both on the same sheet (COI00006033, G00022501, K000232174, P00418346). According to the longer hand-written descriptions attached to the flowering sheets at LISU and BM, leaves were collected in January and flowers in April, indicating separate gatherings, though not necessarily from different trees. The shorter description on both sheets mentions February and April, without specifying either leaves or flowers; the label for "Welw. Iter Angolense" on LISU208886 is unclear ("fl. Feb. [obscured] Apr. 1857"). Hiern (1896) amalgamated this information and stated "In foliage Jan., fl. Feb. and April".

Material collected on different dates, even if from the same tree, constitutes different gatherings and so the flowers and leaves of *Welwitsch* 1787 form at least two separate collections. According to the original hand-written labels, the timing for the collection of flowering material is ambiguous and it is not clear whether flowers were collected twice, or only once and references to flowers in both February and April are due to errors in copying label data. However, if more than one flowering collection was made, we have no means of identifying which flower-heads were collected when. I therefore propose that all the flowering material should be treated as part of the lectotype unless and until someone is able to determine conclusively whether more than one gathering is involved. All the leaf material of *Welwitsch* 1787 is cited among the residual syntypes. Even if the leaves were to be designated as the lectotype, we have no guarantee that they were all collected on the same date in January nor from the same tree.

Besides *Welwitsch* 1787, other Welwitsch material of *Parkia filicoidea* exists. At K, the herbarium catalogue states that "Old fruits of this number [presumably 1787] said to be in the Welwitsch Collection (carp. coll. [504])". Although no material corresponding to this was found in the carp. collection at K nor in the catalogue of Kew's Economic Botany collections in April 2022, a box in the carpological collection at BM (BM001100691) is labelled "*Welwitsch* 504, Maio 1857" and contains bits of broken pod and a seed embedded in pulp; the label states that the pods are eaten by monkeys. Reference to this collection in Hiern's catalogue of Welwitsch's African plants (Hiern 1896, p. 305, "Old fr. end of May 1857") indicated a later collection date than for *Welwitsch* 1787.

According to Figueiredo & Smith (2020), some names for which the authorship is usually given as Welw. ex [...] should be ascribed to Welwitsch alone if the author who published the name used Welwitsch's description. Descriptions by Welwitsch, identical except for the handwriting, are attached to sheets LISU208886 and BM000842195 but Oliver's description in the *Flora of Tropical Africa* (1871) is not identical to them. The name "*Parkia filicoidea* Welw." is given on specimen labels and listed in the index to Oliver's account, but authorship of the name must remain Welw. ex Oliv.

3.2. Parkia hildebrandtii *Harms* (1899: 261).
Parkia filicoidea var. *hildebrandtii* (Harms) Chiov. (Chiovenda 1932: 180). Types as for *P. hildebrandtii*.
Type as cited in protologue: "Sansibar-Küste: Mombassa (Hildebrandt n. 1975. – März 1876)".

Lectotype, designated here: Kenya, Mombassa, March 1876, *Hildebrandt* 1975 (K! K000232175 [lv. & fr.]; isolectotypes: BM! BM013719104, BM001100681 [carp. col.])

Because the sheet of *Hildebrandt* 1975 at B appears to have been destroyed, the K sheet is designated here as the lectotype. A sketch at BM (BM013719105) showing part of a pinna plus part of a pod is labelled "Herb. Berol. 1926" and was probably made by E. G. Baker in preparation for the *Leguminosae of Tropical Africa* (Baker 1930) (J. Wajer, pers. comm. 2022); it may be the only evidence remaining of the material once at B.

Harms (1899) distinguished *Parkia hildebrandtii* by its large, very broad leaflets and stated that the pods were 2 – 2.5 cm broad and scarcely constricted between the seeds. Baker (1930) placed this name in the synonymy of *P. filicoidea* and no major revisions or flora treatments, including that by Brenan (1959) for East Africa, have subsequently recognised *P. hildebrandtii* as distinct at species level. When Chiovenda (1932) published the comb. et stat. nov. *P. filicoidea* var. *hildebrandtii* he cited *Senni* 105 (herbarium not indicated, possibly FI or FT) as a representative collection from Somalia but Thulin (1993) did not maintain this taxon and recorded simply "*P. filicoidea*" for Somalia, based on *Hemming* SRS 568/1 (K!), with *P. hildebrandtii* and *P. filicoidea* var. *hildebrandtii* given in synonymy. Hagos (1962) maintained Chiovenda's variety but cited only two collections, one from Congo (*Herman* 2112, BR! BR0000018850826) and the other from Tanzania (*Peter* s.n., B), and he placed all remaining material from east and central Africa in *P. filicoidea* var. *filicoidea*. In his key, he distinguished var. *filicoidea*, which had "pods cylindrical or nearly so, depressed between seeds" from var. *hildebrandtii* with "pods laterally compressed, not or scarcely depressed between seeds" (Hagos 1962: 236).

3.3. Parkia bussei *Harms* (1902: 154).
Types as cited in the protologue: "Deutsch-Ostafrika: Oberes Kondeland; Flussufer des Kivira-Thals, an den Wugu-Bergen, um 700 m (Goetze n. 1487. – Blühend und mit jungen Hülsen in November 1899). – Ruhuhu-Gebiet (Busse n. 896. – Mit Hülsen im Januar 1901)".
Lectotype, designated here: [Tanzania, Mbeya Region, Rungwe Distr.], Kiwira R., Wugu Hills, Nov. 1899 (1898 – 1900), *Goetze* 1487 (G! G00022502 [lv. & fl.]; isolectotype: E! E00957602, P! P00418349).
Residual syntypes: [Tanzania], Ruhuru region, Jan. 1901 (1900 – 1901), *Busse* 896 (EA!, G! G00022502).

No material of either of the syntypes of *Parkia bussei*, *Goetze* 1487 and *Busse* 896, appears to be extant at B. Both collections are from what is now southern Tanzania. According to Brenan (1959), *Busse* 896 came from the Njombe/Songea Districts in Ruhuhu Region, not far from where *Goetze* 1487 was collected, near the northern end of Lake Malawi, in Rungwe District at the southern tip of Mbeya Region. Another sketch at BM, probably made by E. G. Baker (see above), shows a pinna and a pod from *Busse* 896 and is labelled "Herb. Berol. 1926", presumably based on the material that is no longer extant at B.

Harms (1902) considered that *Parkia bussei* did not differ in its foliage from *P. hildebrandtii* but stated that its pods, at 3.5 cm, were broad. Baker (1930) put *P. bussei* in the synonymy of *P. filicoidea* and the treatment for the Congo (Gilbert & Boutique 1952) is the only major flora to maintain *P. bussei* as distinct, all the others placing this name in the synonymy of *P. filicoidea*, including the treatment by Brenan (1959). Gilbert & Boutique (1952: 141, key) distinguished between the two as follows: *P. bussei*: pods narrowly oblong, flattened, 2.5 – 3.5 cm wide; Upper Katanga; *P. filicoidea*: pods linear-subcylindrical, 1.3 – 1.9 cm wide, constricted between the seeds.

4. *Parkia madagascariensis* R.Vig.
4.1. Parkia madagascariensis *R.Vig.* (Viguier 1949: 348).
Types as cited in the protologue: "Sambirano et Ouest (Secteur Nord) : haute Mananjeba, bois sur granite ; mont Ambohipiraka, bassin de la Mahavavy du Nord ; en général sur les grès liasiques du Sambirano et de l'Andavakoera. *Perrier* 3089, 4265".
Lectotype: Madagascar, [Antsiranana/Diana], Sambirano, Mont Ambohipiraka, Oct. 1909, *Perrier de la Bathie* 3089 (P! P00367693 [lv. & fl.]; isolectotypes: MO, P! ×2 P00367694, P00367698; first-step lectotypification by Villiers [2002: 156], second-step lectotypification made here).
Residual syntypes: Madagascar, [Antsiranana/Diana], Sambirano, Haute Mananjeba, Aug. 1913, *Perrier de la Bathie* 4265 (P! ×3 P00367695, P00367696, P00367697).

Villiers (2002) cited *Perrier de la Bathie* 3098 as the lectotype of this name but because three sheets of this number exist at P, a second-step lectotypification is made here. A sheet of this number is also listed at MO with no image. A sheet at US (US00001036) was collected by Perrier de la Bathie but lacks both a collection number and precise locality so it is not possible to say whether it is an isolectotype or a residual syntype.

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References

Ahossou, E. O. D. (2022). *Diversity of African fruit tree species of the genus* Parkia: *evolutionary history and potential for genetic improvement.* Unpublished PhD thesis, Université Libre de Bruxelles.

____, Daïnou, K., Janssens, S. B., Triest, L. & Hardy, O. J. (2020). Species delimitation and phylogeography of African tree populations of the genus *Parkia* (Fabaceae). *Tree Genetics & Genomes* 16: article 68, 15 pp. https://doi.org/10.1007/s11295-020-01463-x

Aké Assi, L. (2001). Flore de la Côte-d'Ivoire: catalogue systématique, biogéographie et écologie. I. *Boissiera* 57: 1 – 396. (*Parkia* p. 306). https://www.e-periodica.ch/digbib/view?pid=boi-001%3A2001%3A57#4

Albuquerque, S., Brummitt, R. K. & Figueiredo, E. (2009). Typification of names based on the Angolan collections of Friedrich Welwitsch. *Taxon* 58: 641 – 646. https://doi.org/10.1002/tax.582028

Baker, E. G. (1930). Suborder II Caesalpinieae & Suborder III Mimoseae. *The Leguminosae of tropical Africa* Vol. 3. Erasmus Press, Ghent. (*Parkia* pp. 780 – 782).

Brenan, J. P. M. (1959). Leguminosae subfamily Mimosoideae. *Flora of Tropical East Africa.* Pp. 1 – 173. (*Parkia* pp. 7 – 9). Crown Agents for Oversea Governments and Administrations, London.

____ (1970). 61. Leguminosae (Mimosoideae). *Flora Zambesiaca* 3 (1): 7 – 153. (*Parkia* pp. 11 – 14). Published by the Managing Committee on behalf of the contributors to the Flora Zambesiaca: Portugal, Malawi, Zambia and Southern Rhodesia, Crown Agents for Oversea Governments and Administrations, London.

Breteler, F. J. (2005). Novitates Gabonenses 55. Manuscript names and drawings of the French botanist Louis Pierre (1833 – 1905): a discussion about their validity with some examples of nomenclatural consequences for the Gabonese flora in particular. *Adansonia* sér. 3, 27*:* 325 – 335. https://sciencepress.mnhn.fr/sites/default/files/articles/pdf/a2005n2a16.pdf

Brown, R. (1826). Observations on the structures and affinities of the more remarkable plants [...]. In: D. Denham & B. H. Clapperton, *Narrative of travels and discoveries in northern and central Africa* [...] 1822 – 1824, Appendix XXII: 208 – 246 . Murray, London. (*Parkia* pp. 233 – 235).

Chevalier, A. (1908). Novitates florae africanae. *Bull. Soc. Bot. France* 55 (*Mém.* 8b: 31 – 109). (*Parkia* p. 34). https://www.biodiversitylibrary.org/item/14418#page/38/mode/1up

____ (1916). *Les vegetaux utiles de l'Afrique tropicale française.* Vol. 9. *La forêt et les bois du Gabon.* A. Challamel, Paris.

Chiovenda, E. (1932). *Flora Somala* Vol. 2. Sindicato Italiano, Roma. (*Parkia* pp. 179 – 180).

Clapperton, H. & Lander, R. (1829). *Journal of a second expedition into the interior of Africa from the Bight of Benin to Soccatoo by the late Commander Clapperton […].* John Murray, London. https://archive.org/details/journalofseconde00inclap/page/n7/mode/2up?view=theater

Conservatoire et Jardins botaniques, Genève (G). (Database of botanical collections, online). www.cjbg.ch/fr/collections/collections-bases-donnees-ligne [Accessed March 2022]

De Wildeman E. (1907). Etudes systématique et de géographie botaniques sur la flore du Bas- et du Moyen-Congo. *Ann. Mus. Congo Belge, Bot.*, sér. 5, Vol. 2, fasc. 2.

____ (1910). Etudes systématique et de géographie botaniques sur la flore du Bas- et du Moyen-Congo. *Ann. Mus. Congo Belge*, Bot., sér. 5, Vol. 3, fasc. 2. https://www.biodiversitylibrary.org/item/126841#page/9/mode/1up

Duffill, M. (1999). *Mungo Park: West African explorer.* NMS Publishing, Edinburgh.

Estrella, M. de la, Cabezas, F., Aedo, C. & Velayos, M. (2010). *Parkia.* In: M. Velayos (ed.), Leguminosae. *Flora de Guinea Ecuatorial: claves de plantas vasculares de Annobón, Bioko y Río Muni,* Vol. 5: 75 – 76, excl. illustration of *P. filicoidea.* Consejo Superior de Investigaciones Cientificas, Real Jardín Botánico, Madrid.

Exell, A. W. (1944). *Catalogue of vascular plants of São Tomé.* British Museum (Natural History), London.

_____ & Mendonça, F. A. (1956). Leguminosae (Caesalpinioideae – Mimosoideae). *Conspectus Florae Angolensis* 2 (2): 254 – 299. (*Parkia* pp. 256 – 257). Universidade de Coimbra (Instituto Botânico), British Museum (Natural History), London and Centro de Botânica (Instituto de Investigação Científica Tropical), Ultramar.

Figueiredo, E. & Smith, G. F. (2020). Friedrich Welwitsch and his overlooked contributions to the *Flora of Tropical Africa*, with a discussion of the names of *Kalanchoe* (Crassulaceae subfam. Kalanchooideae) that should be ascribed to Welwitsch alone. *Phytotaxa* 458(1): 83 – 100. https://doi.org/10.11646/PHYTOTAXA.458.1.5

GBIF (Global Biodiversity Information Facility, online). www.gbif.org/species/11381060 [Accessed August 2022]

Gilbert, G. & Boutique, R. (1952). 50. Mimosaceae. *Flore du Congo belge et du Ruanda-Urundi* 3: 137 – 233. (*Parkia* pp. 141 –145). I.N.E.A.C., Bruxelles.

Hagos, T. H. (1962). A revision of the genus *Parkia* R. Br. (Mim.) in Africa. *Acta Bot. Neerl.* 11: 231 – 265. https://doi.org/10.1111/j.1438-8677.1962.tb00091.x

Hall, J. B., Tomlinson, H. F., Oni, P. I., Buchy, M. & Aebischer, D. P. (1997). Parkia biglobosa, *a monograph*. School of Agricultural & Forest Sciences, University of Wales, Bangor.

Harms, H. (1899). Leguminosae africanae II. *Bot. Jahrb. Syst.* 26: 253 – 324. (*Parkia* p. 261). https://www.biodiversitylibrary.org/item/686#page/267/mode/1up

_____ (1902). Leguminosae africanae III. *Bot. Jahrb. Syst.* 33: 151 – 181. (*Parkia* p. 154). https://www.biodiversitylibrary.org/item/696#page/161/mode/1up

_____ (1911). Einige Nuthölzer Kameruns. II. Leguminosae. *Notizbl. Königl. Bot. Gart. Berlin, Append.* 21: 9 – 75. (*Parkia* pp. 33 – 34). https://www.jstor.org/stable/27669771

Hasskarl, J. K. (1843). In: J. van der Hoeven & W. H. de Vriese (eds), *Tijdschrift voor natuurlijke geschiedenis en physiologie* Vol. 10. Amsterdam.

Heitz, H. (1943). *La forêt du Gabon*. Larose, Paris. (*Parkia*: 145 – 147).

Herbarium Berolinense (B). (Database of botanical collections, online). ww2.bgbm.org/herbarium/default.cfm [Accessed March 2022]

Hiern, W. P. (1896). *Catalogue of the African plants collected by Dr Frederich Welwitsch in 1853 – 1861*, Vol. 1 part 1. British Museum (Natural History), London. (*Parkia* p. 305).

Hopkins, H. C. (1983). The taxonomy, reproductive biology and economic potential of *Parkia* (Leguminosae: Mimosoideae) in Africa and Madagascar. *Bot. J. Linn. Soc.* 87: 135 – 167. https://doi.org/10.1111/j.1095-8339.1983.tb00987.x

IPNI (International Plant Names Index, online). www.ipni.org [Accessed March 2022]

Jacquin, N. J. (1763). *Selectarum stirpium americanarum historia*. Vindobonae, ex officina Krausiana.

Jstor Global Plants. (Database of type collections, online). https://plants.jstor.org/ [Accessed March 2022]

Keay, R. W. J. (1955). A new species of *Parkia* R. Br.. *Bull. Jard. Bot. État Bruxelles* 25: 209 – 212.

_____ (1958). 90. Mimosaceae. *Flora of West Tropical Africa*, 2nd ed., Vol. 1 (2): 484 – 504. (*Parkia* p. 487). Crown Agents for Oversea Governments and Administrations, London.

Kew Herbarium Catalogue (K). (Database of botanical collections, online). http://apps.kew.org/herbcat/ [Accessed March 2022]

Lebrun, J.-P. & Stork, A. L. (1992). *Parkia*. In: *Enumération des Plantes à fleurs de Afrique tropicale* Vol. 2: 35. Editions des Conservatoire et Jardin botanique, Geneva.

Lock, J. M. (1989). *Legumes of Africa, a check-list*. Royal Botanic Gardens, Kew. (*Parkia* pp. 98 – 99).

Loudon, J. C. (ed.) (1830). Loudon's *Hortus britannicus*. Longman, Rees, Orme, Brown & Green, London.

Mabberley, D. J., Moore, D. T. & Wajer, J. (2022). The Robert Brown handbook: a guide to the life and work of Robert Brown (1773 – 1858), Scottish botanist. *Regnum Veg.* Vol. 160. Koeltz Botanical Books, Glashütten.

Macbride, J. F. (1919). Notes on certain Leguminosae. *Contr. Gray Herb.* n.s. 3, 59: 1 – 27. https://www.biodiversitylibrary.org/item/123407#page/704/mode/1up

Meise Botanic Garden (BR). (Database of botanical collections, online). www.botanicalcollections.be/#/en/home [Accessed March 2022]

Museum national d'Histoire naturelle, Paris (P). (Database of collections [Sonnerat], online). science.mnhn.fr/institution/mnhn/collection/p/item/search/form?lang=en_US. [Accessed March 2022]

Natural History Museum, London (BM). (Database of collections, online). data.nhm.ac.uk/dataset [Accessed March 2022]

Naturalis Biodiversity Center (L, WAG). (Database of collections, online). bioportal.naturalis.nl [Accessed March 2022]

Naturhistorisches Museum Wien (W). (Database of collections, online). www.jacq.org/#database [Accessed March 2022]

Oliver, D. (1871). Leguminosae suborder III Mimoseae. *Flora of Tropical Africa* 2: 321 – 364. (*Parkia* pp. 323 – 324). L. Reeve & Co., London. https://www.biodiversitylibrary.org/item/60248#page/335/mode/1up

Palisot de Beauvois, A. M. F. J. (Text: 21 Feb. 1818, Plate: 26 Aug. 1816). *Inga biglobosa. Flore d'Oware et de Benin en Afrique*, Vol. 2: 53, Plate 90. Fain & Co., Paris.

Park, M. (1799, 2nd ed.). *Travels in the interior districts of Africa*. London.

Pellegrin, F. (1924). La Fore du Mayombe d'après les récoltes de Georges Le Testu. Part 1. *Mem. Soc. Linn. Normandie* Vol. 26.

Royal Botanic Garden, Edinburgh (E). (Database of collections, online). data.rbge.org.uk/search/herbarium/ [Accessed March 2022]
Schwartz, J. S. (2021). Robert Brown and Mungo Park: travels and exploration in natural history for the Royal Society. *Mem. New York Bot. Gard.* Vol. 122. https://doi.org/10.1007/978-3-030-74859-3
Smithsonian National Museum of Natural History (US). (Database of collections, online). https://collections.nmnh.si.edu/search/botany/ [Accessed March 2022]
Taxonomic Literature II (TL-2, online). www.sil.si.edu/DigitalCollections/tl-2/ [Accessed March 2022]
Thiers, B. M. (updated continuously). *Index Herbariorum*, online. http://sweetgum.nybg.org/science/ih/ [Accessed March 2022]
Thulin, M. (1993). *Flora of Somalia* Vol. 1. Royal Botanic Gardens, Kew. (*Parkia* pp. 362 – 363).
Tropicos (MO). (Database of collections, Missouri Botanical Garden, online). http://legacy.tropicos.org/ [Accessed March 2022]
van der Maesen, L. J. G. (2006). *Parkia.* In: A. Akoègninou, W. J. van der Burg & L. J. G. van der Maesen (eds), *Flore analytique du Bénin*: 641 – 643. Backhuys, Cotonou & Wageningen.
Viguier, R. (1949). Leguminosae madagascarienses novae. *Notul. Syst.* (*Paris*) 13: 333 – 369. (*Parkia* pp. 347 – 348).
Villiers, J.-F. (1989). Leguminosae – Mimosoideae. *Flore du Gabon* 31: 1 – 185. Muséum National d'Histoire Naturelle, Paris. (*Parkia* pp. 26 – 33).
____ (2002). *Parkia.* In: D. J. du Puy (ed.), *The Leguminosae of Madagascar*, pp. 156 – 157. Royal Botanic Gardens, Kew.
Willdenow, C. L. (1806). *Caroli a Linné Species Plantarum, editio quarta,* 4: 1025. Impensis G. C. Nauk, Berolini.

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